

An Application for a
Linux Australia Grant



An open-source project
for the trucking industry
towards safer Australian roads.

THE WAIT ADVISOR: USING DATA SCIENCE TO IMPROVE ROAD SAFETY

The Problem

Many truck drivers, particularly the long-haul ones, are being subjected to long waits, at no fault of their own, in the beginning and at the end of each segment of their journey. They come to work prepped for driving, but the loading of cargo onto trucks is not done on time. There are also queues of trucks waiting to be loaded with cargo. These waits can go for hours, such that when the truck finally hits the road, the fitness-to-drive of the driver would have already gone down. At the end of a trip, the same routine happens. Unloading is not done on time, and queues usually build up. The driver, again, must suffer the wait. At present, too much focus and attention is given on fatigue management systems, from on-board sensors and fatigue detection mechanisms to the most ergonomic and comfortable sleeping beds, but this fundamental issue on the ground has been glossed over.

The trucking industry keeps the Australian economy moving, literally. Truck drivers are on the road for up to 14 hours moving cargo and making deliveries. They ensure that there is food in the supermarket, supplies in the office, and things we need at the shops when we need them. Subjecting them to delays add to the pressure to make each leg of a trip on time—it detracts the driver, it lowers morale, and it pushes the driver to speed up. These delays at loading and unloading points diminish fitness-to-drive. These delays are unfair, unnecessary, and could be significantly reduced, if not eliminated, through more efficient business processes. On one hand, loading and unloading should be made more efficient. On the other, trip planning could take wait times into consideration such that trucks arrive at their destination just-in-time for loading or unloading. This is where The Wait Advisor comes in.

The Solution

The Wait Advisor is an app that will be made available for free to truck drivers. Through the app, truck drivers can anonymously record wait times in almost any location. Data will be stored in a cloud repository and using data science, we plan to expose delays in the supply chain across Australia. By making this data available:

- Businesses will be able to identify areas where improvements can be made to make processes more efficient and more compliant with legislation. Under new Chain of Responsibility (CoR) rules of the National Heavy Vehicle Regulator (NHVR), every party in the heavy vehicle transport supply chain, including those involved in consigning, packing, loading, or receiving goods, are obliged to eliminate or minimise potential harm, loss or risk by doing all that is reasonably practicable to ensure safety. This obligation includes compliance with speed, fatigue and loading requirements.
- Regulators will have actionable data to encourage changes in business practices that cause delays and long wait times. Regulators can be more effective and persuasive in getting businesses take responsibility for their share under the CoR.
- The trucking industry will have scientific data to back it up in lobbying and discussing with businesses involved in the supply chain to effect improvements at the loading and unloading points.
- Researchers will have baseline data on delays, which could then branch off to other lines of enquiry which will in one way or another ultimately address road safety.

Efforts from the businesses, the regulators, and the trucking industry, together, will then contribute concrete steps at eliminating or reducing delays. Drivers will be more fit-to-drive, and in the end, Australian roads will be safer for everyone.

Statistics show that at least 210 die each year and 1,700 are hospitalised due to accidents involving heavy vehicles. One of the known causes is driver fatigue, which is a complex problem that should be addressed from different approaches. Eliminating delays that impact fitness-to-drive is one of these approaches, and if we can save at least one life through this project, this is one well worth doing.

Parts of a Whole

There are vital parts of the whole which are critical to the success of this project. These are:

- Community engagement – We need truck drivers to actually use the app if we are to gather meaningful data which we can then use to provide actionable statistics. We are currently working with the Australian Trucking Association through its CEO Ben Maguire on how to promote the project to its wide membership. The ATA has published our short pitch on the ATA social media account in Facebook (see <https://www.facebook.com/truck.australia/videos/856056621258833/>) and in YouTube (see <https://youtu.be/o-Hjqo4NID0>). Meanwhile, we have also put up the project website (see <https://waitadvisor.in2teq.com/>), a blog for project updates (see <http://blog-waitadvisor.in2teq.com/>), and a Patreon account to attempt to get financial support from the community at large (see <https://www.patreon.com/waitadvisor>). Efforts at reaching out to as many Australian truck drivers as possible are on-going.
- The mobile app – We need the app developed soon. It has to be free to use and to download, it has to be available in both Apple and Android devices, and it has to be as simple as possible to use. The demographics of Australian truck drivers show that majority are in the middle age, so we need the app to be uncomplicated.
- The backend – We are currently evaluating our options on the backend. Cloud repositories from Amazon (AWS), Google (Firebase), Microsoft (Azure) and IBM (Watson) have caught our attention. The bottom line, however, will be the cost of operating the system in the long run.
- The data – We are making the raw data available to both the regulator and the industry association for free, but we intend to present the information to the stakeholders in the format that is easy to understand. Thus, we will not only need statistical processing, we also need to develop a dashboard of sort and visualisation in the form of a heat map for delays. We currently have the option of using Google maps API and develop our own presentation or use existing software such as Tableau.

Linux Australia Grant

We have embarked on the Wait Advisor as a project because we believed that we were doing something that could effect changes in the trucking industry in a very profound way. This has been validated by the truck drivers we have spoken to and by those who have commented on the pitch video that the ATA published on our behalf. The project, however, strains our personal finances and thus the realisation that we need partners, sponsors and patrons that would help us get this done. Specifically, we need Five Thousand Australian Dollars (A\$5,000.00) to get the project up and running, which will be used in the following areas:

- A\$2,500.00 for app development in IOS (and the cost of publishing in the Apple Appstore). The app development will be outsourced off-shore (a contractor has already been engaged) but the source code will be published publicly in Github.
- A\$2,500.00 for app development in Android. The app development will likewise be outsourced off-shore (a contractor is yet to be identified) and the source code will be published publicly in Github.

The apps will be developed as open source. Publication of the source code as open source is welcomed for the following reasons:

1. As an example of production-grade app in both IOS and Android, the Wait Advisor source code will be instructive. Any interested party will be able to have a sample of a working app and learn therefrom by reverse engineering.
2. The problem that the app is trying to solve is not unique to Australia or the trucking industry. By making the source code available as open source to the world, anyone can build on the project and customise as needed.
3. Community contributors may be able to help improve and optimise the app. This will then allow for a sustainable model of continuous improvement in an open and transparent manner.
4. By making the app source code as open source, we are giving a further layer of assurance to the truck drivers that user data will be anonymous. Anonymity of users is a big concern for drivers because unscrupulous businesses at the ends of the supply chain can engage in retaliatory practices that could mean loss of business for the small business truck owners.

Finally, the potential impact of the project itself is profound. The project aims to improve fitness-to-drive which translates to safer roads. If this project will be able to save at least one life, this is something worth every support it can get.

Deliverables

For purposes of the Linux Australia grant, the deliverables will be as follows:

1. The Wait Advisor IOS app published in the Apple Appstore (free to download and use);
2. The Wait Advisor Android app published in Google Playstore (free to download and use);
3. The Wait Advisor IOS source code published as open source in the Github repository; and
4. The Wait Advisor Android source code published as open source in the Github repository.

In addition to contributing to the open source space, Linux Australia will likewise be acknowledged in the project website, within the app, and in all materials as a sponsor, side-by-side with the Australian Trucking Association.

Sustainability and Moving Forward

Recurring costs of the project, such as cloud services subscription fees and use, will be covered by revenue which will be generated from advertising. We plan to put up a website that would be available for the public to view data on delays (businesses will not want to be identified here as a delay point, hence a strong persuasion for them to get their acts together and improve processes to eliminate delays) in addition to future roll-out of the app with industry-specific advertising. Revenue from ad placements will be used to pay for cloud services.

Project Proponents

Manuel Diaz (Linux Australia Member / Email thediazes@outlook.com) is a Sydney-based Information Technology professional with 20 years of experience as trusted business partner delivering business value-adding technology solutions. He is qualified in Information Technology, Computer Engineering and Law. He has a couple of innovation patents in the mobile technology space and is quite keen to find ways by which technology can be used to address the myriad of challenges that face us today.



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